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Hwang

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[54] **PANEL ATTACHMENT FOR ELECTRICAL CONNECTOR**

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[51] **Int. Cl.**[7] **H01R 13/74**

[52] **U.S. Cl.** **439/557**

[58] **Field of Search** 439/248, 557, 439/247, 567; 248/27.3; 411/508

[56] **References Cited**

U.S. PATENT DOCUMENTS

4,988,308	1/1991	Toedtman	439/557
5,017,151	5/1991	Peterson	439/557
5,286,222	2/1994	Yagi et al.	439/557

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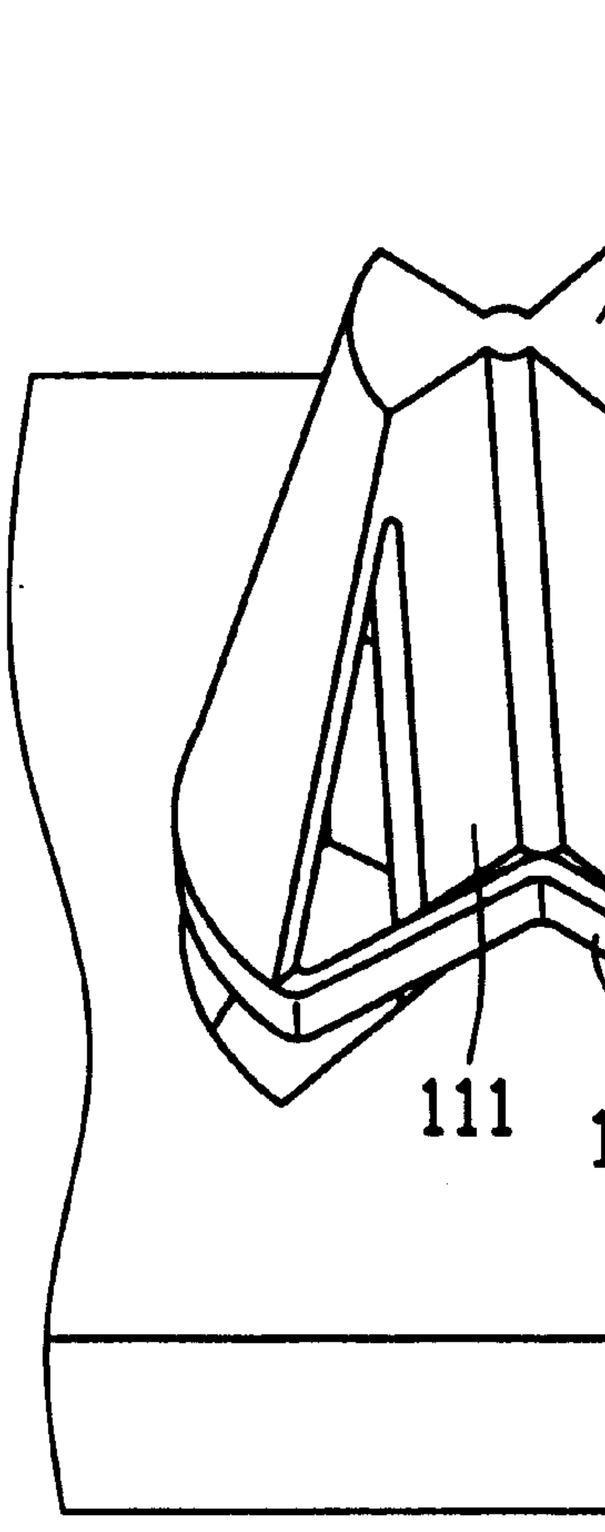
[57] **ABSTRACT**

A panel attachment for attaching an electrical connector to a panel having at least a hole therein, the attachment comprises a base plate. A supporting upright extends from the base plate through the hole of the panel. A pair of deflectable vane sectors extends outward and downward from a tip of the upright toward the base plate to an extent such that a gap is defined between free ends of the vane sectors and the base plate. Flexible strips are formed between the upright and the vane sectors for limiting over-stretching of the vane sectors.

6 Claims, 7 Drawing Sheets



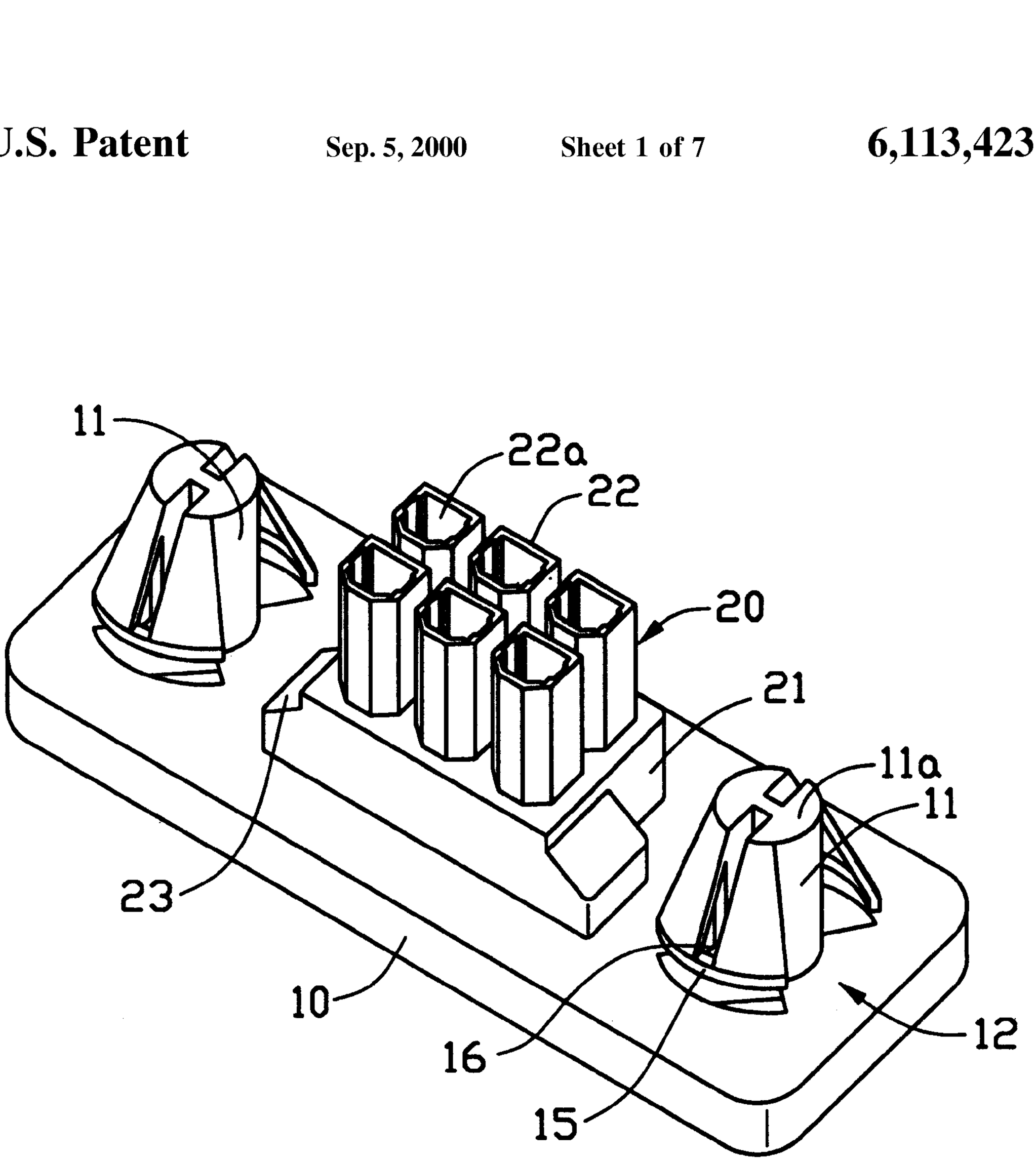


FIG. 1

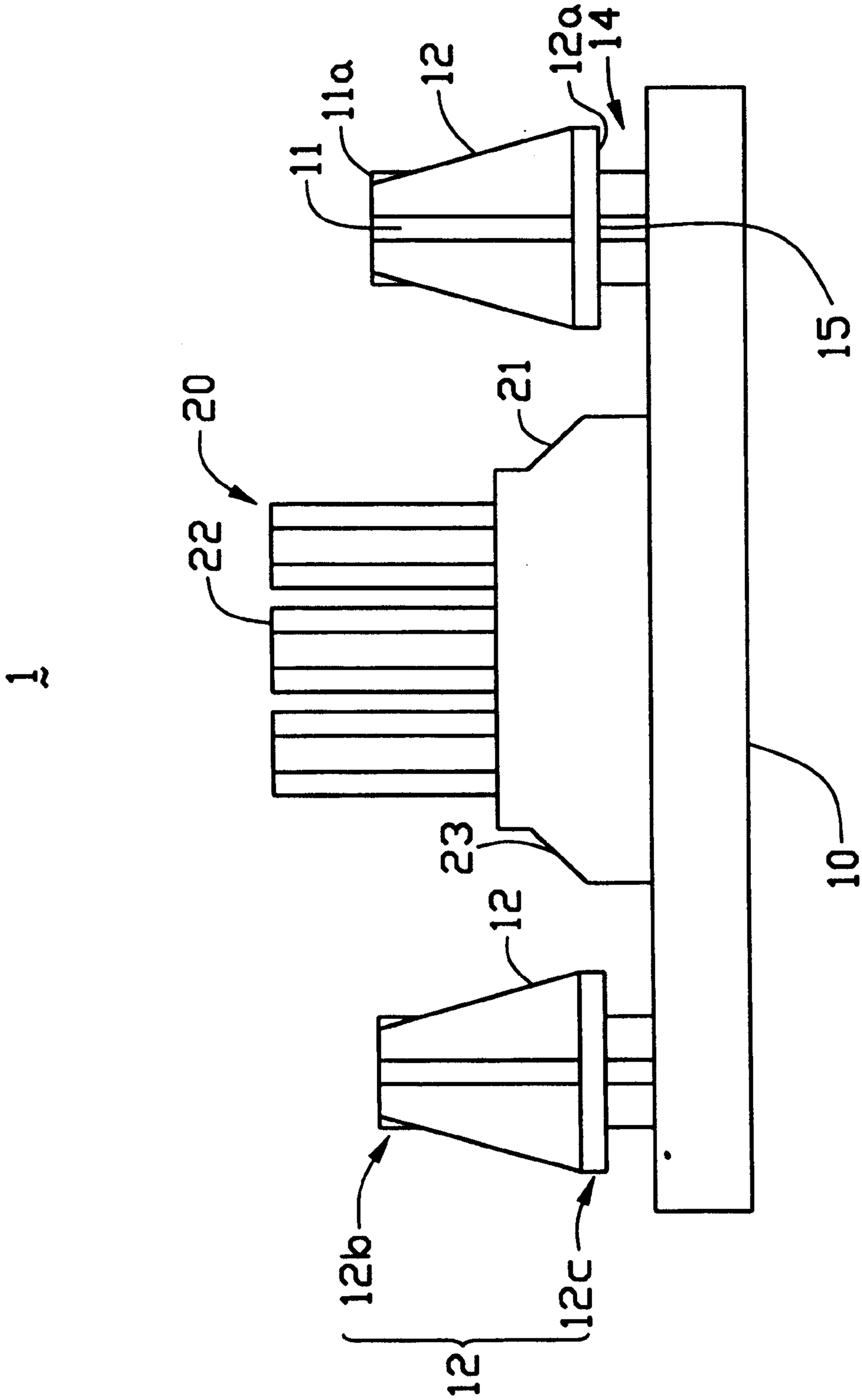


FIG. 2

1

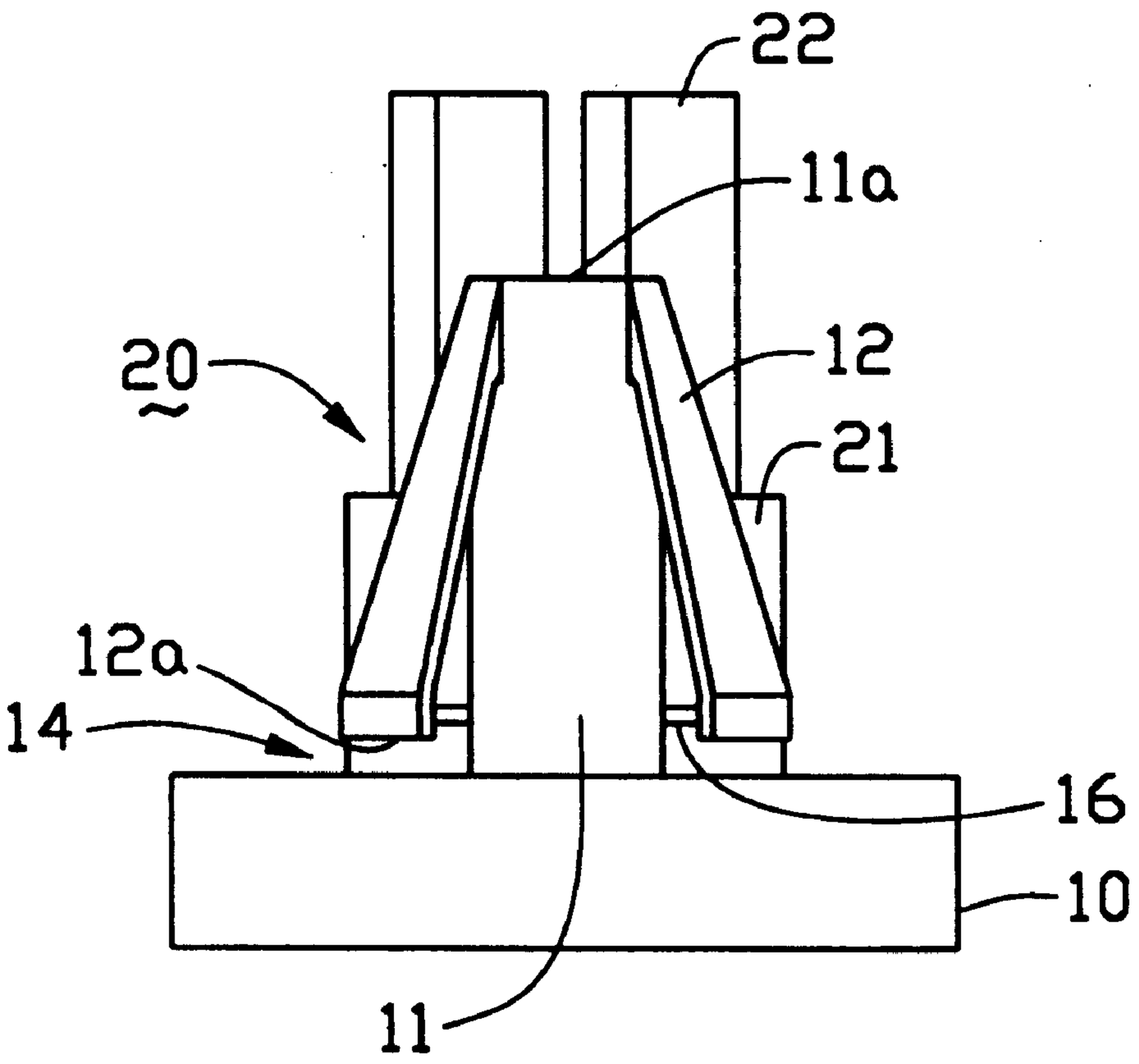


FIG. 3

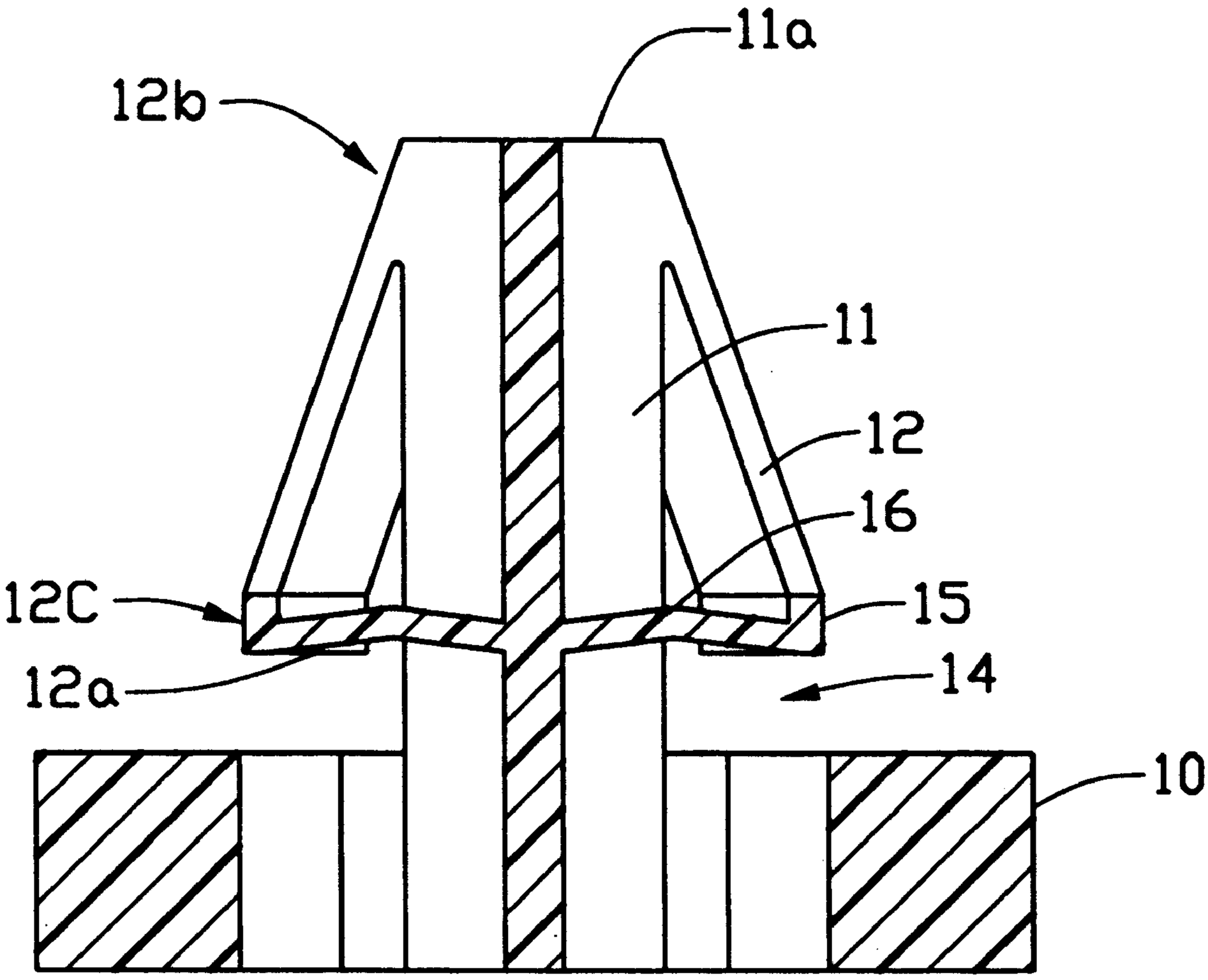


FIG. 4

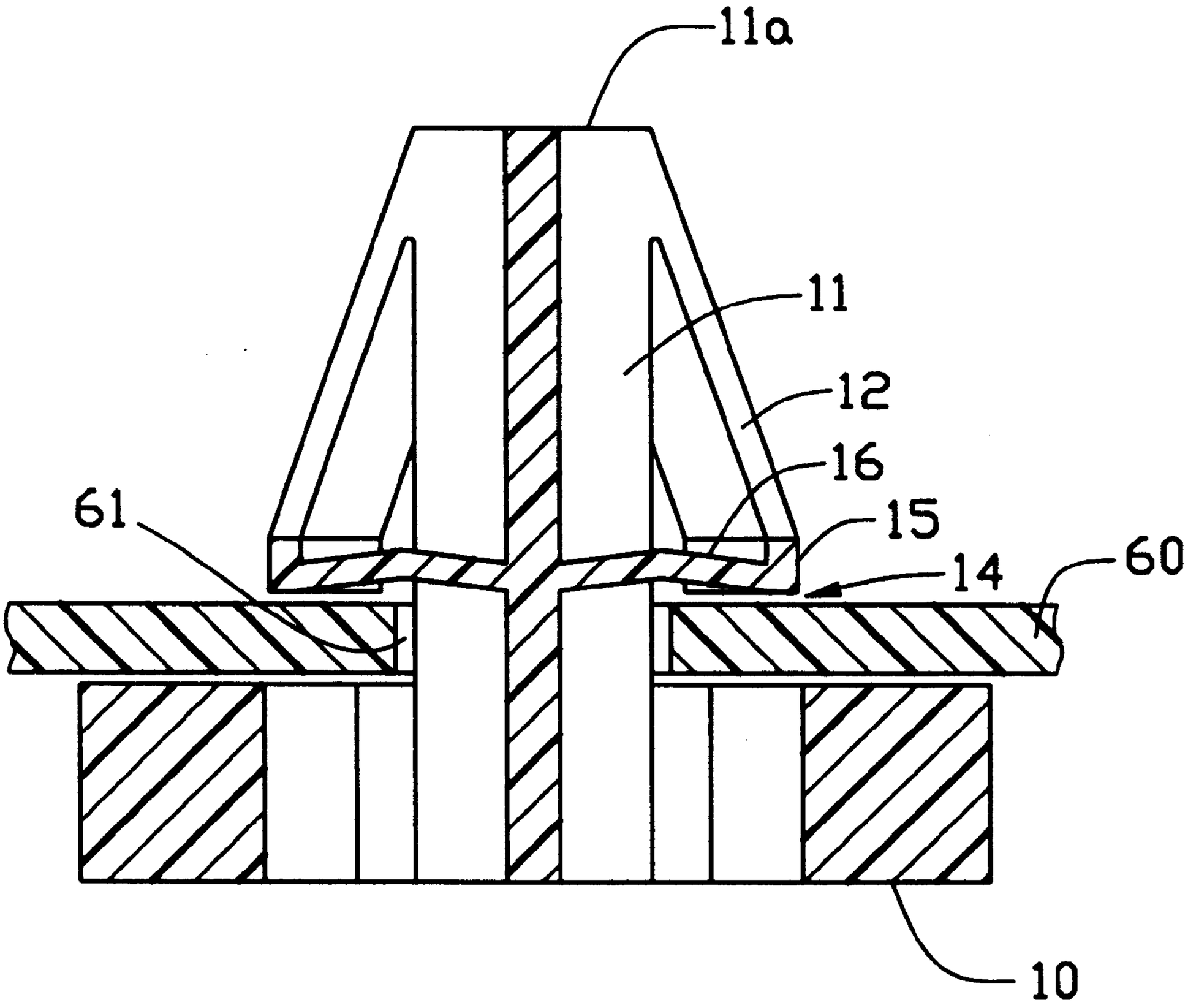


FIG. 5

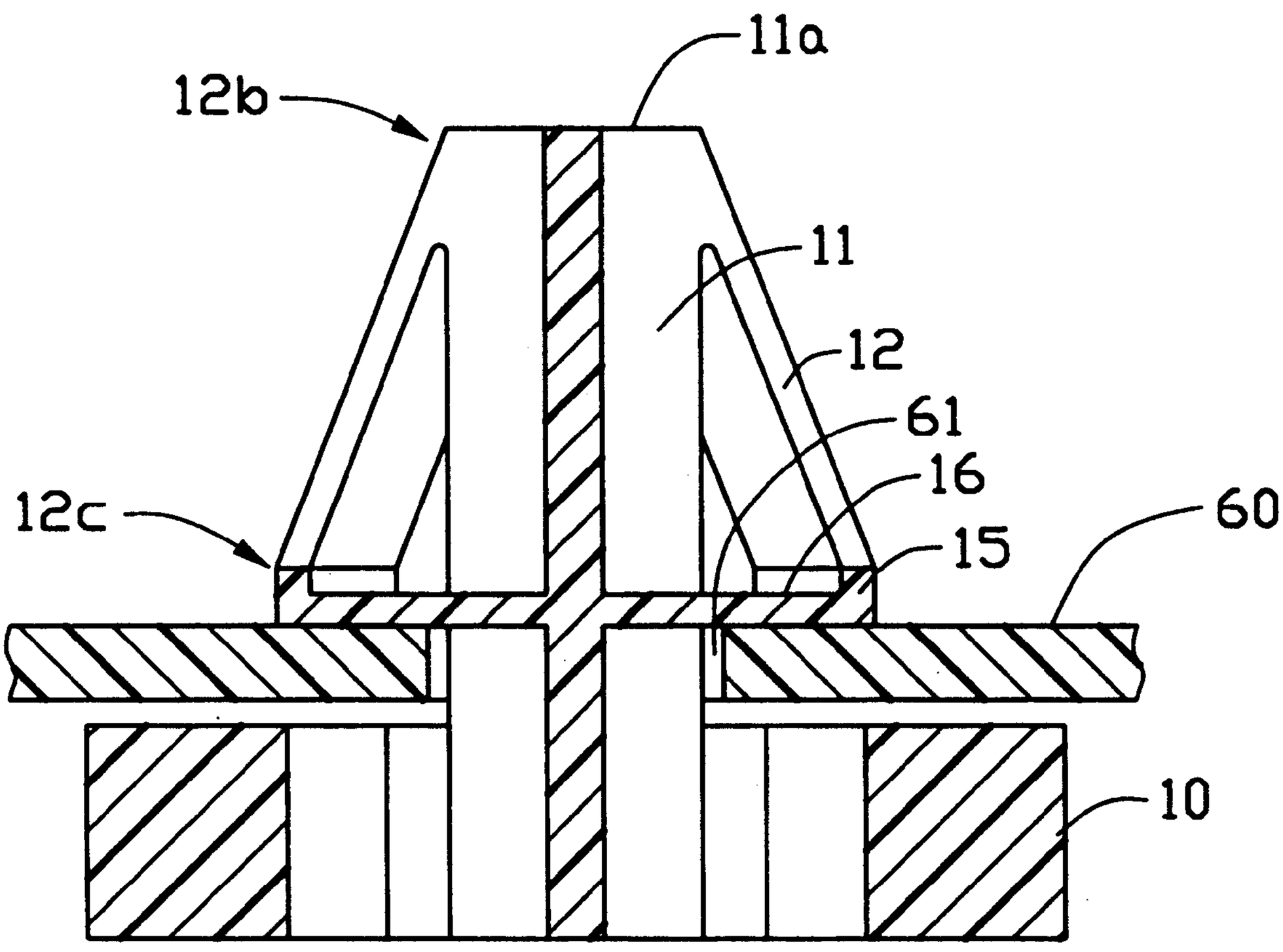


FIG. 6

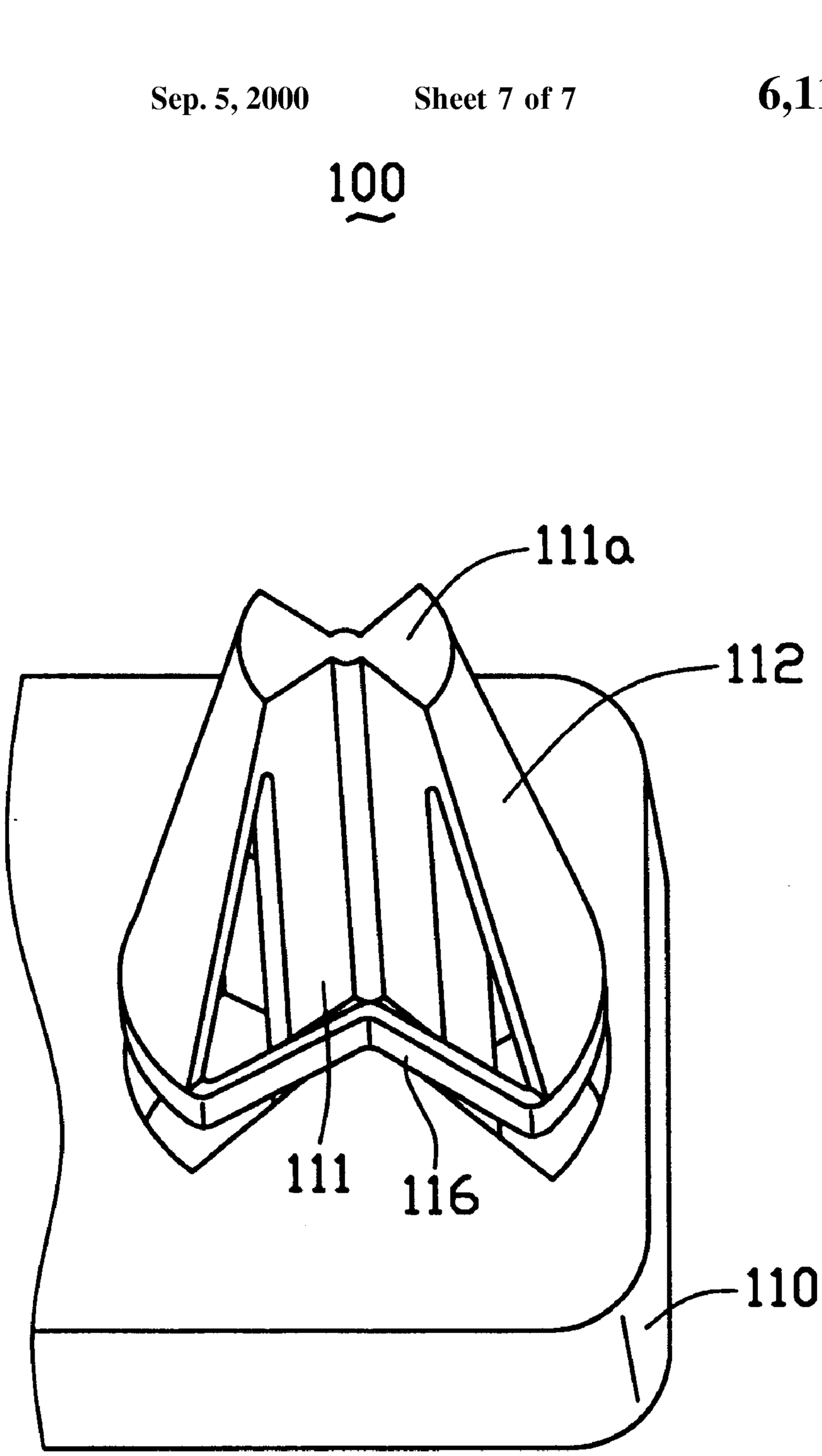


FIG. 7

PANEL ATTACHMENT FOR ELECTRICAL CONNECTOR

FIELD OF THE INVENTION

The present invention relates to a panel attachment, and more particularly to a panel attachment having flexible strip for prevent over-stretching of anchoring vanes.

DESCRIPTION OF PRIOR ART

Many prior art connectors have been provided with means for attaching the connector to a panel. Even the prior art panel mounted connector may readily be assembled to the panel, one problem needs to be solved is the backward movement of the connector during mating with a complementary connector. This is because the panel mounted connector is mounted to the panel from a bottom face of the panel. When the complementary connector is mated from a top face of the panel, the panel mounted connector is pushed downward with respect to the panel.

U.S. Pat. No. 4,988,308 discloses a panel mount having spiral vanes extending helically along the length of a support post. Even the configuration is extremely effective, free ends of the spiral vanes are vulnerable to deflect when excess mating force is exerted thereto, especially when incorrect complementary connector is mated thereto.

SUMMARY OF THE INVENTION

It is an objective of this invention to provide a panel attachment having flexible strip to prevent over-stretching of anchoring vane sectors.

In order to achieve the objective set forth, a panel attachment for attaching an electrical connector to a panel having at least a hole therein, the attachment comprises a base plate. A supporting upright extends from the base plate through the hole of the panel. A pair of deflectable vane sectors extends outward and downward from a tip of the upright toward the base plate to an extent such that a gap is defined between free ends of the vane sectors and the base plate. Flexible strips are formed between the upright and the vane sectors for limiting over-stretching of the vane sectors.

According to an aspect of the present invention, flexible strips are formed between two adjacent vane sectors to limit over-stretching of the vane sectors.

These and additional objects, features, and advantages of the present invention will become apparent after reading the following detailed description of the preferred embodiments of the invention taken in conjunction with the appended drawing.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is a perspective view of a panel attachment with a connector thereon;

FIG. **2** is a front view of FIG. **1**;

FIG. **3** is an end view of FIG. **1**;

FIG. **4** is a cross sectional view taken along line IV—IV of FIG. **2**;

FIG. **5** is similar to FIG. **4** showing the panel attachment is assembled to a panel;

FIG. **6** is similar to FIG. **5** showing vane sectors are limited from over-stretching by the help of strips; and

FIG. **7** is a perspective view of a second embodiment in accordance with the present invention.

DETAILED DESCRIPTION OF PREFERRED EMBODIMENT

Referring to FIGS. **1**, **2**, **3** and **4**, a panel attachment **1** in accordance with the present invention comprises a base plate

10. A pair of supporting upright **11** extends from opposite ends **10***a* of said base plate **10**. The supporting uprights **11** are integrally formed with the base plate **10**. Two pair of deflectable vane sectors **12** extend outward and downward from a tip **11***a* of said upright **11** toward said base plate **10** to an extend such that a gap **14** is defined between lower ends **12***a* of said vane sectors **12** and said base plate **10**. The deflectable vane sectors **12** generally form a frusto-conical shape thereby defining a top **12***b* and a base **12***c* which is larger than the top **12***b* in diameter. Since each vane sector **12** is cantilevered to the upright **11**, the vane sector **12** can move toward the upright when the lower end **12***a* is squeezed inward thereby reducing the diameter thereof.

According to the preferred embodiment, each individual vane sector **12** is interconnected by a bridge **15** which is further interconnected to a root portion **11** b of the upright **11** by a flexible strip **16** extending generally along a redial direction. By this arrangement, outward movement of the lower end **12***a* of the vane sector **12** is limited. As a result, permanent deformation of the vane sectors **12** is therefore eliminated.

A housing **21** of an electrical connector **20** is integrally formed with the base plate **10**. The housing **21** further forms an array of silos **22** each defining a receiving space **22***a* therein for mounting a terminal therein (not shown). The housing **21** further includes side blocks **23** for polarization.

Referring to FIGS. **5** and **6**, in assembly the top **12***b* of the panel attachment **1** may readily extends through a hole **61** defined in a panel **60**. Since each vane sector **12** is cantilevered to the upright **11**, the lower ends **12***a* of the vane sector **12** can deflect inward such that the lower end **12***a* thereof may slide over the inner rim of the hole **61**. Finally, the panel **60** is floatably located in the gap **14** defined between the lower ends **12***a* and the base plate **10**. When the lower end **12***a* of the vane sector **12** is moved inward, the strip **16** is also deflected upward to make the inward movement of the vane sector **12** possible. In addition, when the lower ends **12***a* pass over the inner rim of the hole **61**, the lower ends **12***a* are moved outward by its potential resilient force and the extension of the strip **16**. This ensure the lower ends **12***a* to move further away from the hole **61** thereby providing reliable attachment.

FIG. **7** is a panel attachment **100** in accordance with a second embodiment of the present invention. The panel attachment **100** includes a base plate **110** having an upright **111** extending therefrom. A pair of vane sectors **112** symmetrically extends outward and downward from a top **111***a* of the upright **111**. The vane sectors **112** are interconnected by an inwardly deflectable strip **116** generally extending along a circumferential path of lower edges of said pair of van sectors **112** thereby limiting the over-stretch of the vane sectors **112**.

While the present invention has been described with reference to specific embodiment, the description is illustrative of the invention and is not to be construed as limiting the invention. Various modifications to the present invention can be made to the preferred embodiment by those skilled in the art without departing from the true spirit and scope of the invention as defined by the appended claims.

I claim:

1. A panel attachment for attaching an electrical connector to a panel having at least a hole therein, said attachment comprising:

a base plate;

a supporting upright extending from said base plate through said hole of said panel;

at least a deflectable vane sector extending outward and downward from an upper portion of said upright toward said base plate to an extent such that a gap is defined between a free end of said vane sector and said base plate; and

interconnecting means between said upright and said vane sector for limiting over-stretching of said vane sector;

wherein said interconnecting means is a flexible strip bridging between a lower end of said van sector and a root portion of said upright; and

wherein said deflectable vane sector forms a part-conical shape having an upper end smaller than said hole and a base larger than said hole.

2. The panel attachment as recited in claim **1**, wherein said gap is approximately equal to a thickness of said panel.

3. A panel attachment for attaching an electrical connector to a panel having at least a hole therein, said attachment comprising:

a base plate;

a supporting upright extending from said mounting panel through said hole of said panel to a distance;

a pair of deflectable vane sectors extending outward and downward from an upper portion of said upright toward said base plate to an extend such that a gap is defined between free ends of said vane sectors and said base plate; and

interconnecting means between two adjacent vane sectors for limiting over-stretching of said vane sectors.

4. An electrical system, comprising:

a panel having at least a mounting hole therein;

an electrical connector adapted to be secured to said panel; and

at least a panel attachment engageable to said mounting hole for attaching said electrical connector to said mounting panel, said panel attachment including a base plate on which said electrical connector is seated, at least a supporting upright extending from said base plate through said hole of said panel, deflectable vane sectors extending outward and downward from an upper portion of said upright toward said base plate to an extend such that a gap is defined between a free end of said vane sectors and said base plate, and interconnecting means for limiting outwardly over-stretching of said vane sectors, wherein said interconnecting means includes at least a flexible strip between two adjacent vane sectors.

5. The electrical system as recited in claim **4**, wherein a housing of said connector is integrally formed with said base plate.

6. The electrical system as recited in claim **4**, wherein said strip extends generally along a circumferential path of lower edges of said two vane sectors.

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